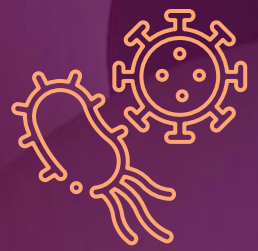
جامعة المعارف
UNIVERSITY OF AL MAARIF
كلية التقنيات الصحية والطبية
College of Health and Medical Techhniques

MEDICAL HELMINTHOLOGY



Dr. Mohammed Jamal Mansoor
Ph. D. Medical Microbiology

COLLEGE OF HEALTH AND MEDICAL TECHNOLOGY
DEPARTMENT OF MEDICAL LABORATORY TECHNIQUES

Department of Medical Laboratory Technology

2nd stage (2025)

Lecture (1-1)

Introduction

Learning Objectives

- Understand medically important Helminthes including their **life cycles**, **modes of transmissions**, **clinical features**, **diagnosis**, **treatment** and **prevention**.
- Describe blood, intestinal, liver and lung **flukes**.
- Understand common **round worms**.
- Understand different species of **Cestodes**.

Medical helminthology is concerned with the study of helminthes or parasitic worms. Helminthes are trophoblastic metazoa (multi-cellular organisms).

Helminthes are among the common parasitic causes of **human suffering**.

They are the cause of high **morbidity** and **mortality** (Death rate) of people worldwide.

They cause different diseases in humans, but few helminthic infections cause **life- threatening diseases**.

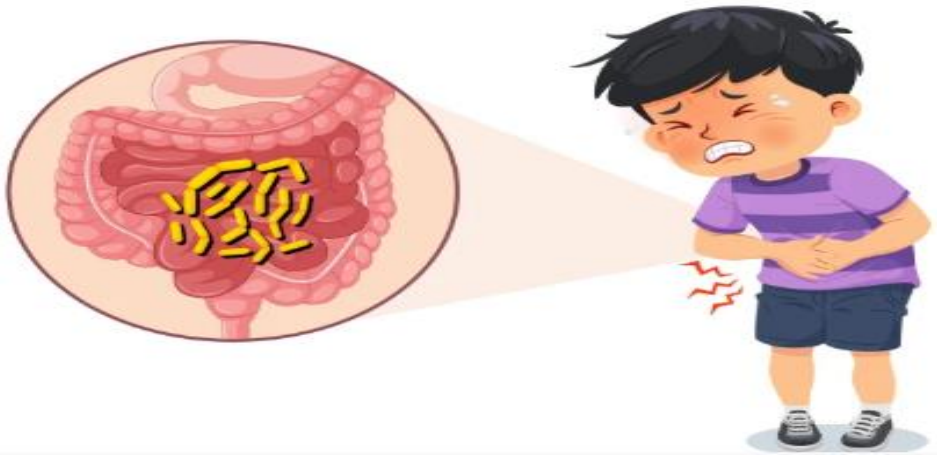
They cause **anemia** and **malnutrition**. In children they **cause a reduction in academic performance**.

Helminthes also cause **economic loss** as a result of **infections of domestic animals.**

There is age dependent distribution of infections from geo-helminthes and schistosomes. As a result of predisposing behavioral and immunological status, **children** disproportionately carry the burden of schistosomes and geo-helminthes.

Q: Helminths are multicellular organisms belong to

A- virus
B- Metazoa
C- Fungi
D- bacteria
E- All of the above



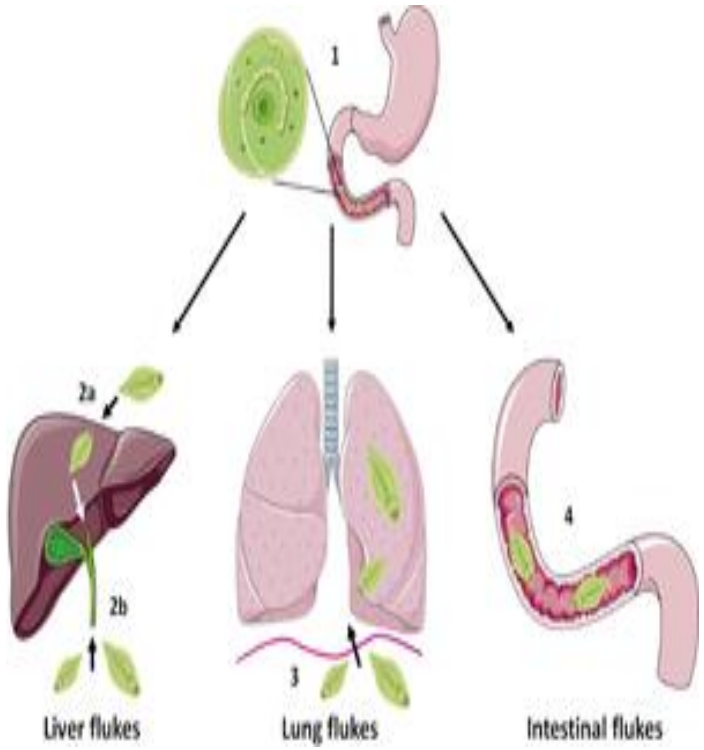
The sources of the parasites are different. Exposure of humans to the parasites may occur in one of the following ways:

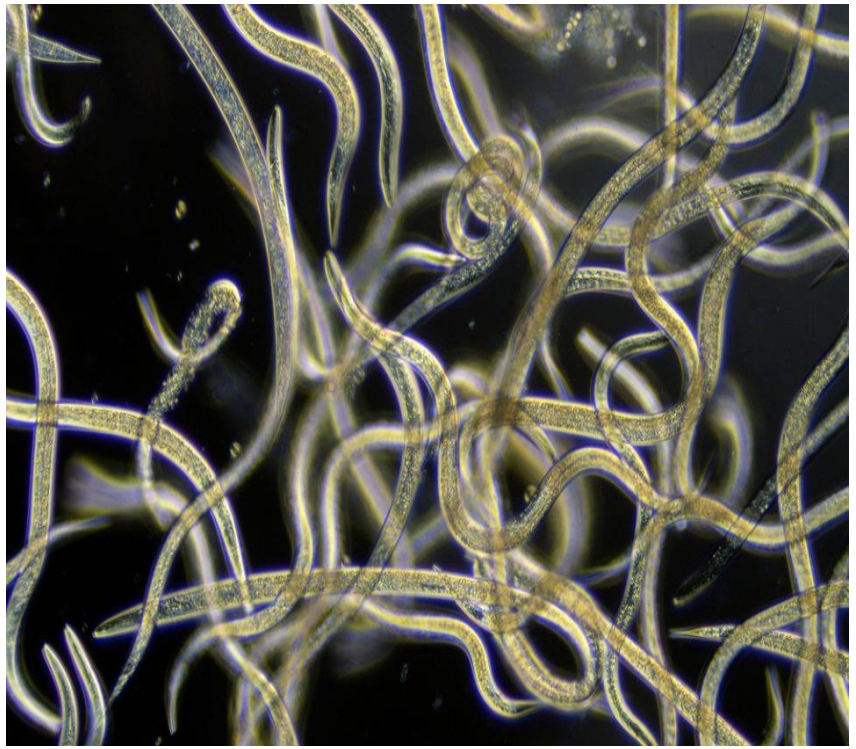
1. Contaminated **soil** (**Geo-helminthes**), **water** (**cercariae of blood flukes**) and **food** (**Taenia in raw meat**).
2. Blood sucking insects or arthropods **(as in filarial worms).**
3. Domestic or wild animals harboring the parasite **(as in echinococcus in dogs**).
4. Person to person **(as in *Enterobius vermicularis, Hymenolopis nana*)**.
5. Oneself **(auto-infection)** as in ***Enterobius vermicularis.***

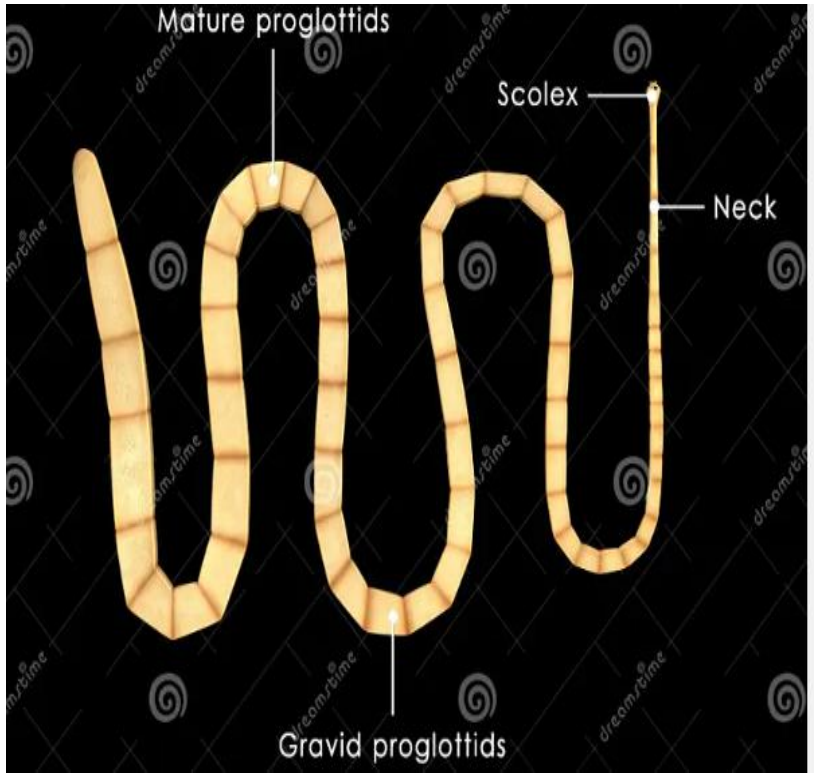
They enter the body through different routes including: mouth, skin and the respiratory tract by means of inhalation of airborne eggs.

The helminthes are classified into three major groups. These are:

1. Trematodes (Flukes) **2. Nematodes (Round worms)** **3. Cestodes (Tape worms)**







	Cestodes	Trematodes	Nematodes
Shape	Tape-like, segmented	Leaf-like unsegmented	Elongated, cylindrical, unsegmented
Head end	Suckers present; some have attachedhooks	Suckers are present but no hooks	Hooks and sucker absent. Well- developed buccal capsule with teeth or cutting plates seen in some species
Alimentary canal	Absent	Present but incomplete, no anus	Complete with anus
Body cavity	Absent, but inside is filled with spongy undifferentiated mesenchymatous cells, in the midstof which lie the viscera	Same as cestodes	Present and known as **pseudocele**. Viscera remains suspended in the pseudocele

	Cestodes	Trematodes	Nematodes
Sex	Not separate: hermaphrodite (monecious)	Not separate: hermaphrodite except *Schistsoma*	Separate (diecious)
Life cycle	Requires 2 host except *Hymenolepis* (1 host) and *Diphyllobothrum* (3 host)	Requires 3 host except schistosomes (2 host)	Requires 1 host except filarial worms (2 host) and *Dracunculus* (2 host)

جدول المقارنة مهم جدا

Q: Nematodes are differentiated from other worms by the following EXCEPT

A- Absent fragmentation
B- Flat or fleshy leaf-like worm
C- Separate sexes
D- Cylindrical body
E- None of them

Q: Digestive tract is completely absent in

A- Trematoden
B- Cestodes
C- Nematodes
D- All helminthes
E- None of the above

Phylum: platy-helminthes

Class :cestoda

Genus : Taenia

Species : ***Taenia -saginata , Taenta –solium***

Common name **:(beef tapeworm) , (pork tapeworm)** Disease **taeniasis**

Taenia.saginata , Taenia-solium the largest of species in the genus of taenia .

the adult normally **4 -10-M** in length, but can become very large **over 22M** long are reported.

It **zoonotic disease** , in small intestinal parasite where the **human** harboring the adult as **definitive host** and **cattle** are **intermediated host** where larval development occur .

Typical of cestode the body **ribbon-like** ,white in color , is **flattened**.
-dorsoventrally and heavily **segment** the body consists three portion.

1- scolex (head)

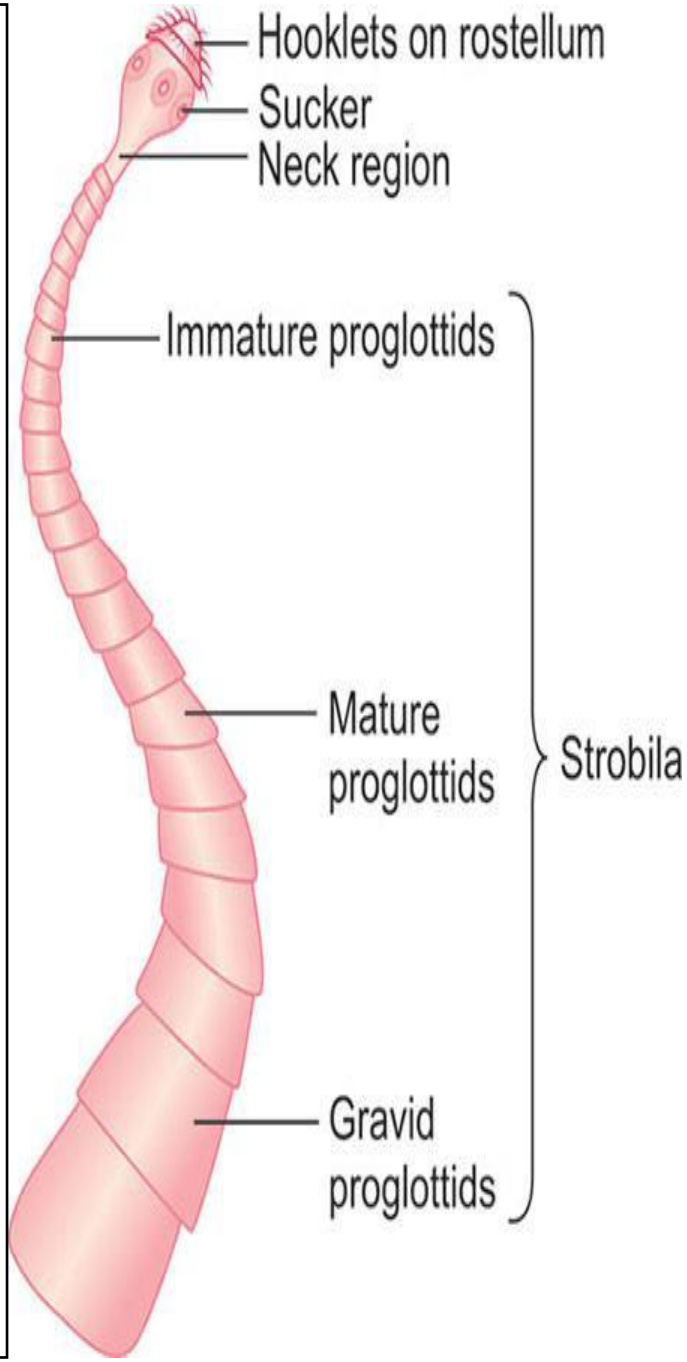
2- neck

3- Trunk , proglottid (**segment**) **strobili** ***Taenia saginata***

The scolex (head) have **four sucker** in ***T. saginata*** **without hook** identifying feature from other taenia ,the sucker used for **attachment** in wall ofsmall intestine, ***Taenia solium*** have **four sucker** and **rostellum** armed with **hook**.

The neck in both are short consist from the germ layer and **immature proglottids (segment)**

The last body consist from **mature segment and gravid proglottids**, and have about (**1000-2000)** proglottids in Taenia –saginata and Taenia- solium about (**800- 1000)** segment , doesn't contain digestive system from mouth to anus , it derives the **nutrient from the host by tegument cells.**



- **Tegument cells** cover with absorptive hair for absorption of nutrient and each segments have good development reproduction system consist from **testes** and **ovary**, **uterus**, **vagina** and **genital pore** and vitellaria (yolk–gland) its (**hermaphrodite**). each proglottids carries a set of female and male reproduction organs.
- **also the *T. saginata* and *T. solium* have nerve center composed from ganglion in scolex and the small fiber nerve supply the general body.**

Q- Head of cestodes is also known as

A- Bothria

B- Hooks

C- Scolex

D- Suckers

Q: Beef are the source of human infection for :

A- *Taenia solium*

B- *Echinococcus granulosus*

C- *Schistosoma mansoni*

D- *Taenia saginata*

E- *Hymenolepis nana*

Q: Which one of the following is concerning cestoda :

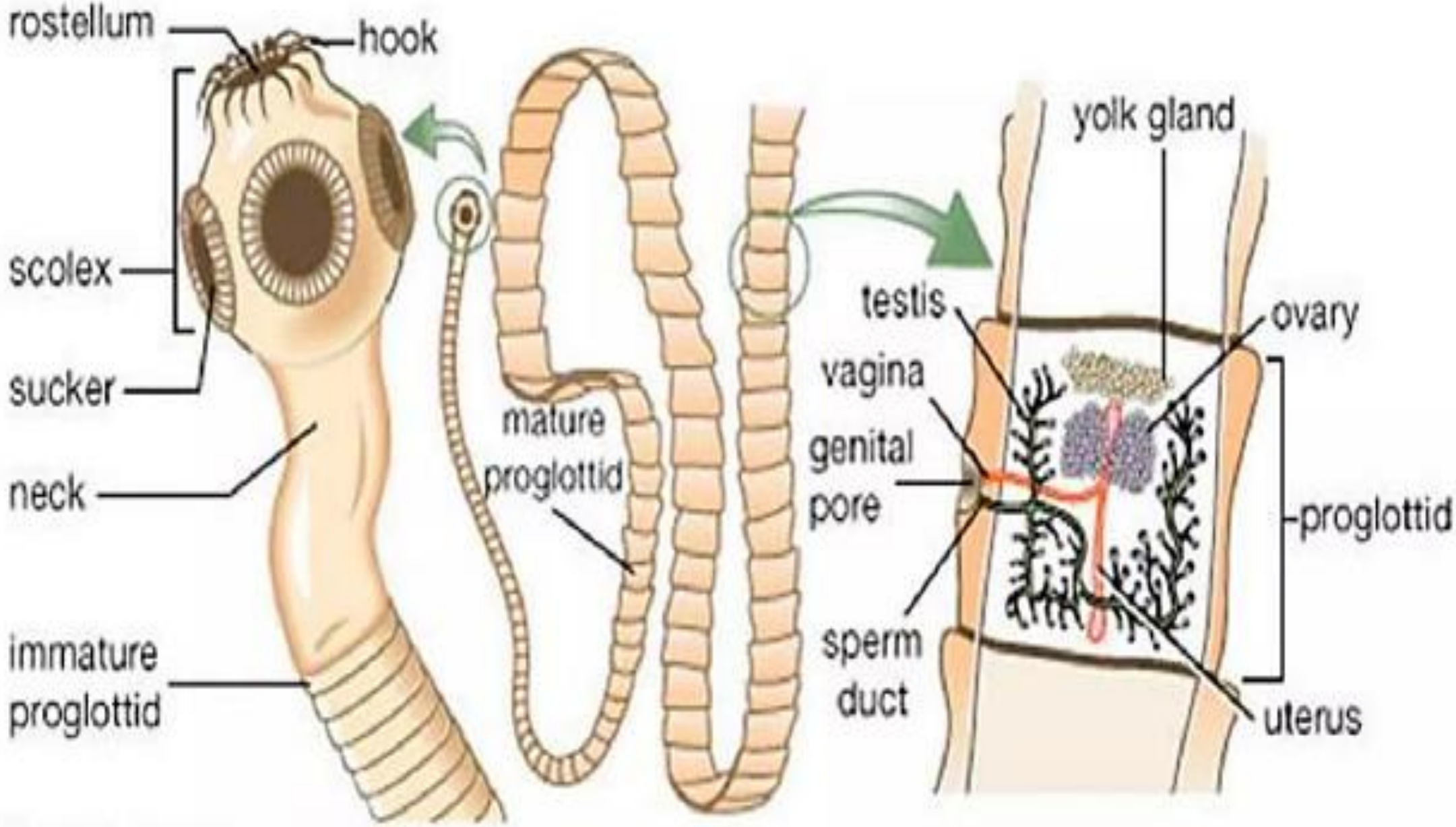
A- Unicellular parasite

B- Separate male and female

C- Male contains capulatory bursu

D- *Enterobius vermicularis*

E- *Taenia saginata*


rostellum
hook
scolex
sucker
neck
immature proglottid
mature proglottid
yolk gland
testis
ovary
vagina
genital pore
sperm duct
proglottid
uterus